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short excursions in every direction around, which, without exposing his men to serious risk, will be better for them than idleness or inactivity.

Some time may thus elapse before the full value and extent of these discoveries can be ascertained; but meanwhile it may be asserted, without fear of contradiction, that to the liberality and enterprise of one of her youngest colonial offshoots, backed by the heroic self-devotion of Burke and Wills, Great Britain owes the acquisition of millions of available acres, destined at no distant day to swell her imports and afford fresh markets for her manufactures.

7. *On the Gold-Fields of Tuapeka, in New Zealand.*

By J. THOMPSON, Esq.

HEREWITH I have the pleasure of sending a photograph of the gully or valley in which so much gold has been found in this province. The gully is called "Gabriel's," after J. Gabriel Read, the discoverer. It is situated 35 miles west from Dunedin, and 30 north from the mouth of Clutha River, Otago Province. When I was there, a month ago, 6000 people were employed in digging. The photograph will require a lens to analyze the picture; as the naked eye will not discover all the figures represented. I also enclose a small map of the province, lithographed in my office, which will show you the Tuapeka gold-field. I have marked in yellow other spots where gold has been found, but which are not yet worked. I would have sent information to the Society before, but was desirous of seeing the rush over before spreading the news. Much misery is entailed by these blindfold rushes that take place in Australia. The advance of the gold-field will now, however, rest on its own merits; as the excitement has cooled down. The escort brings gold down to Dunedin once a fortnight, and on the last two occasions brought down 12,000 and 16,000 ounces respectively; the digging population being about 6000 to 8000. What I am desirous of laying before the Society is a sketch of the formations of the province, from which its eminent members will be able to anticipate the results of the discovery to this small but interesting colony of Scotchmen.

I may premise that Mr. Ligur, now Surveyor-General of Victoria, was the first to discover gold in this province; since which time it has been detected by various parties, myself included: but no field of enticing richness was found out till Gabriel Read published his discovery. I visited the field when it was first worked, and afterwards when it was in full operation.

The province, which I have traversed in all directions, has great sameness of formation, the mountains consisting of schists and clay-slates. Granites, amygdaloids, and porphyries are found at the Bluff and in the mountains due north from that harbour; I have seen them nowhere else. The seaboard and river-valleys consist of sedimentary formations; such as sand-beds, conglomerates of quartz, pebbles, limestones, coal (rather lignite), and clay-beds. Here and there very frequently basalt, trap, and metamorphic rocks protrude, often in hexagonal prisms. The quartz conglomerates are very abundant, and consist of rounded quartz, cemented by an iron cement; in places taking the appearance of burnt earth. The limestones appear very modern (geologically speaking); I have found recent shells, vertebræ of the *Moa*, bones of small birds, beak included, in this formation. The prevailing formation, however, is schistose, and is almost universally traversed by small veins of quartz, or else nodules of quartz; and the débris of this formation is found in the river-beds, consisting of rounded quartz or flakes of schist. The quartz veins are generally ferruginous. Quartz reefs have not yet been found to my know-

ledge, though I have seen blocks of pure quartz 20 feet cube in size. However, quartz pebbles are very abundant everywhere, especially on the sea-coast between the Bluff Harbour and the Watuara. Inland of this, hills actually covered with quartz pebbles are found.

The gold has been found in the gravel and shales of the valleys, 2 to 15 feet from the surface; but much dry digging is going on over the adjacent hills, which pays fair wages, that is, 10s. to 20s. per diem. The largest nugget that I have seen weighed 2 oz. 2 dwts. The gold is generally small and scaly. In the deep sinkings now going on (20 to 30 feet), quartz boulders are said to be arrived at, but I have not seen them. This summer will give the field a fair trial, as fully 20,000 diggers will be at work in all directions.

In this map you will observe that the interior lakes have been delineated: this summer they are to be actually surveyed. The scenery about them is very rugged and grand. I explored the northern lakes during 1858, along the base of the Southern Alps. Mount Cook, 13,000 feet in height, is a glorious giant. It would be difficult to ascend, being conical, and covered with snow in Midsummer down to 6000 feet elevation. The upper valley of the Waitaki, which I traversed *alone* to near the base of Mount Cook, was wild and sterile in the extreme. The waters of the Pukaki Lake are as white as milk. Mount Aspiring and Mount Stokes are also splendid features. The country which I then surveyed was unoccupied; now every portion is taken up for pastoral purposes.

It will be noticed that a new province has been detached from Otago, and named Smithland. If Mr. Tucket were to come back he would be convinced that they can grow wheat without covering the shocks with tarpaulins. The old whalers told him this to prevent a settlement being formed near them, and led to his very unfavourable report in the Society's Journal.

More satisfactory information will, I hope, soon be given by Dr. Hector, a geologist engaged by the Otago Government to explore its resources.
